

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-5 (Cancelled).

Claim 6 (Currently Amended): A process for manufacturing ~~the hydrogen-trapping compound of Claim 1~~ a hydrogen-trapping compound, comprising at least one mineral compound of general formula:

MX(OH)

wherein:

- M represents a divalent transition element;

- O represents an oxygen atom;

- X represents an atom of group 16 of the Periodic Table of the Elements,  
excluding O; and

- H represents a hydrogen atom, comprising:

mixing, in aqueous solution, at least one dissolved salt of dissolved  $X^{2-}$  and at least one dissolved metal salt of M forming a precipitate of the at least one metal sulphide of the formula MX(OH); wherein the precipitate is suspended in the aqueous phase.

Claim 7 (Currently Amended): The process of Claim 6, wherein the  $X^{2-}$  salt is  $Na_2X$ ,  $(NH_4)_2X$ ,  $Li_2X$ ,  $K_2X$  or a mixture thereof.

Claim 8 (Previously Presented): The process of Claim 6, wherein the metal salt of M is selected from the group consisting of:  $MSO_4 \cdot xH_2O$ ;  $M(NO_3)_2$ ;  $M(ClO_4)_2 \cdot xH_2O$ ; and  $MCl_2$ ; wherein M represents a divalent transition element; and wherein x is a number greater than or equal to zero.

Claim 9 (Previously Presented): The process of Claim 8, wherein M is Co or Ni.

Claim 10 (Previously Presented): The process of Claim 8, wherein X is S.

Claim 11 (Previously Presented): The process of Claim 6, wherein the mixing in aqueous solution is carried out a pH of 4 to 12.

Claim 12 (Previously Presented): The process of Claim 6, wherein the molar ratio of the concentrations  $[X^{2-}]/[M^{2+}]$  is from 0.875:1 to 1.5:1.

Claim 13 (Previously Presented): The process of Claim 6, wherein the at least one precipitated metal salt is extracted from the suspension in the aqueous phase; wherein extraction comprises: filtering, washing with water, and drying.

Claim 14 (Currently Amended): A method of encapsulating a solid waste comprising:

a) encapsulating the solid waste and ~~the hydrogen-trapping compound of Claim 1~~ a hydrogen-trapping compound, comprising at least one mineral compound of general formula:

MX(OH)

wherein:

- M represents a divalent transition element;

- O represents an oxygen atom;

- X represents an atom of group 16 of the Periodic Table of the Elements,

excluding O; and

- H represents a hydrogen atom,

with an organic encapsulation material to form an encapsulant; wherein prior to encapsulation the solid waste, the hydrogen-trapping compound, and the organic encapsulation material are heated; and wherein prior to encapsulation the organic encapsulation material is liquefied;

b) cooling the encapsulant; and

c) solidifying the encapsulant.

Claim 15 (Previously Presented): The method of Claim 14, wherein the organic encapsulation material is a bitumen.

Claim 16 (Previously Presented): The method of Claim 14, wherein the solid waste is non-radioactive.

Claim 17 (Previously Presented): The method of Claim 14, wherein the solid waste is radioactive.

Claim 18 (Previously Presented): The method of Claim 15, wherein the hydrogen-trapping compound is mixed with the bitumen in an amount of 1.5 to 82% in total, expressed as mass of trapping compound with respect to the mass of bitumen.

Claim 19 (Previously Presented): The method of Claim 17, wherein the radioactive waste represents at least 45 wt% of the total mass of the solid waste encapsulated with the composite organic material.

Claim 20 (Previously Presented): The method of Claim 17, further comprising chemically coprecipitating the radioactive waste in solid form and the hydrogen-trapping compound in order to obtain a solid phase comprising a mixture of the radioactive solid waste and of the hydrogen-trapping compound prior to being encapsulated.

Claim 21 (Currently Amended): An organic material for encapsulating radioactive waste, comprising an organic encapsulation material and at least one hydrogen-trapping compound of ~~Claim 1~~, comprising at least one mineral compound of general formula:



wherein:

- M represents a divalent transition element;

- O represents an oxygen atom;

- X represents an atom of group 16 of the Periodic Table of the Elements, excluding O; and

- H represents a hydrogen atom.

Claim 22 (Previously Presented): The organic material for encapsulating radioactive waste of Claim 21, wherein the organic encapsulation material is a bitumen.

Claim 23 (Previously Presented): The organic material for encapsulating radioactive waste of Claim 21, wherein the at least one hydrogen-trapping compound represents in total an amount of 1.5 to 82% expressed as mass of trapping compound with respect to the mass of bitumen.

Claims 24-26 (Canceled).

Claims 27 (Currently Amended): A method for trapping hydrogen comprising contacting the hydrogen with ~~the compound of Claim 1~~ at least one mineral compound of general formula:

                    MX(OH)

                    wherein:

                    - M represents a divalent transition element;

                    - O represents an oxygen atom;

                    - X represents an atom of group 16 of the Periodic Table of the Elements,  
                    excluding O; and

                    - H represents a hydrogen atom.

Claim 28 (Previously Presented): The method of Claim 27, wherein the hydrogen is produced by radiolysis of a radioactive waste and wherein the trapping is conducted within an organic material which encapsulates the both the hydrogen-trapping compound and the radioactive waste.

Claim 29 (Previously Presented): The method of Claim 28, wherein the organic material is bitumen.

Claim 30 (New): The method of claim 27, wherein M is selected from the group consisting of Cr, Mn, Fe, Co, Ni, Cu and Zn.

Claim 31 (New): The method of claim 27, wherein X is selected from the group consisting of S, Se, Te and Po.

Claim 32 (New): The method of claim 27, wherein M is Co or Ni.

Claim 33 (New): The method of claim 27, wherein X is S.

Claim 34 (New): The process of claim 6, wherein M is selected from the group consisting of Cr, Mn, Fe, Co, Ni, Cu and Zn.

Claim 35 (New): The process of claim 6, wherein X is selected from the group consisting of S, Se, Te and Po.

Claim 36 (New): The method of claim 14, wherein M is selected from the group consisting of Cr, Mn, Fe, Co, Ni, Cu and Zn.

Claim 37 (New): The method of claim 14, wherein X is selected from the group consisting of S, Se, Te and Po.

Claim 38 (New): The method of claim 14, wherein M is Co or Ni.

Claim 39 (New): The method of claim 14, wherein X is S.

Claim 40 (New): The organic material of claim 21, wherein M is selected from the group consisting of Cr, Mn, Fe, Co, Ni, Cu and Zn.

Claim 41 (New): The organic material of claim 21, wherein X is selected from the group consisting of S, Se, Te and Po.

Claim 42 (New): The organic material of claim 21, wherein M is Co or Ni.

Claim 43 (New): The organic material of claim 21, wherein X is S.